

CLAIMS

1. A black colored steel sheet comprising: a Zn-Ni plating steel sheet which is processed by blackening treatment; and a coating film formed on a surface of the Zn-Ni plating steel sheet by applying a paint composition which contains (a) metal ions, (b) a water soluble organic resin, (c) a water dispersible organic resin, (d) a glycoluril resin, and (e) an acid.

2. The black colored steel sheet according to Claim 1, wherein the metal ions (a) are at least one type selected from the group consisting of Al ions, Mg ions, and Mn ions.

3. The black colored steel sheet according to Claim 1, wherein the metal ions (a) comprises at least one type selected from the group consisting of Al ions, Mg ions, and Mn ions and ions of at least one metal selected from the group consisting of Zn, Co, Ti, Sn, Ni, Fe, Zr, Sr, Y, Nb, Cu, Ca, V, and Ba.

4. The black colored steel sheet according to Claim 1, wherein the addition amount of the metal ions (a) to the total of the metal ions (a), the water soluble organic resin (b), the water dispersible organic resin (c), the glycoluril

resin (d), and the acid (e) is in the range of 0.1 to 50 mass percent.

5. The black colored steel sheet according to Claim 1, wherein the water soluble organic resin (b) comprises at least one type of polymer of a monomer containing a carboxyl group and/or at least one type of copolymer of a monomer containing a carboxyl group and another polymeric monomer.

6. The black colored steel sheet according to Claim 1, wherein the addition amount of the water soluble organic resin (b) to the total of the metal ions (a), the water soluble organic resin (b), the water dispersible organic resin (c), the glycoluril resin (d), and the acid (e) is in the range of 0.1 to 20 mass percent.

7. The black colored steel sheet according to Claim 1, wherein the addition amount of the water dispersible resin (c) to the total of the metal ions (a), the water soluble organic resin (b), the water dispersible organic resin (c), the glycoluril resin (d), and the acid (e) is in the range of 40 to 80 mass percent.

8. The black colored steel sheet according to Claim 1, wherein the addition amount of the glycoluril resin (d) to

the total of the metal ions (a), the water soluble organic resin (b), the water dispersible organic resin (c), the glycoluril resin (d), and the acid (e) is in the range of 1 to 40 mass percent.

9. The black colored steel sheet according to Claim 1, wherein the acid (e) is at least one selected from the group consisting of phosphoric acid, acetic acid, nitric acid, hydrofluoric acid, and vanadic acid.

10. The black colored steel sheet according to Claim 1, wherein the acid (e) comprises an organic acid which can be coordinated with a metal of bivalence or more and at least one selected from the group consisting of phosphoric acid, acetic acid, nitric acid, hydrofluoric acid, and vanadic acid.

11. The black colored steel sheet according to Claim 1, wherein the addition amount of the acid (e) to the total of the metal ions (a), the water soluble organic resin (b), the water dispersible organic resin (c), the glycoluril resin (d), and the acid (e) is in the range of 1 to 20 mass percent.

12. The black colored steel sheet according to Claim 1,

wherein the coating film has a thickness of 0.1 to 3 μm .